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enhanced for more flexible patent number searching
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=> s lower (2w) alkyl (2w) triglyceride (2w) ester
1461876 LOWER

29960 LOWERS
 1486904 LOWER
 (LOWER OR LOWERS)
 617794 ALKYL
 6723 ALKYL
 620835 ALKYL
 (ALKYL OR ALKYL)
 47667 TRIGLYCERIDE
 43441 TRIGLYCERIDES
 76131 TRIGLYCERIDE
 (TRIGLYCERIDE OR TRIGLYCERIDES)
 628579 ESTER
 461696 ESTERS
 872410 ESTER
 (ESTER OR ESTERS)

L1 0 LOWER (2W) ALKYL (2W) TRIGLYCERIDE (2W) ESTER

=> s tributyrin
 1984 TRIBUTYRIN
 1 TRIBUTYRINS
 L2 1984 TRIBUTYRIN
 (TRIBUTYRIN OR TRIBUTYRINS)

=> s l2 and transesterification
 22238 TRANSESTERIFICATION
 305 TRANSESTERIFICATIONS
 22303 TRANSESTERIFICATION
 (TRANSESTERIFICATION OR TRANSESTERIFICATIONS)

L3 95 L2 AND TRANSESTERIFICATION

=> s l3 and butyrate
 29434 BUTYRATE
 986 BUTYRATES
 29966 BUTYRATE
 (BUTYRATE OR BUTYRATES)

L4 29 L3 AND BUTYRATE

=> d l4 1-10 ibib abs

L4 ANSWER 1 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:359366 CAPLUS

DOCUMENT NUMBER: 148:540257

TITLE: Comparative study of triglyceride transesterification in the presence of catalytic amounts of sodium, magnesium, and calcium methoxides

AUTHOR(S): Martyanov, Igor N.; Sayari, Abdelhamid

CORPORATE SOURCE: Department of Chemistry, University of Ottawa, Ottawa, K1N 6N5, Can.

SOURCE: Applied Catalysis, A: General (2008), 339(1), 45-52
 CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A solution of Mg(OCH3)2 in methanol, inhouse prepared solid MgOx(OCH3)2-2x, and com. Ca(OCH3)2 were tested at 60 °C in transesterification of tributyrin with methanol - a model reaction for biodiesel

production The homogeneous magnesium methoxide acts fast at the beginning of the reaction but quickly forms a suspension/precipitate mixture of much lower catalytic activity. The precipitate was found to be a complex composition including

glycerol and butyric acid derivs. The reaction over solid $MgOx(OCH_3)_2-2x$ is catalytic but sluggish with deactivation taking place in ca. 4 h. Anal. of the used catalyst revealed surface butyric acid as the most likely species responsible for the catalyst deactivation. In the presence of $Ca(OCH_3)_2$, the yields of the products reach final values in about 4 h. The reaction starts as a heterogeneous process, however, interaction of $Ca(OCH_3)_2$ with reaction products such as glycerol gives rise to catalytically active homogeneous species. Formed in a side reaction calcium butyric acid derivs. contribute to $Ca(OCH_3)_2$ dissoln. but do not deactivate the surface of the catalyst.

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 2 OF 29 CAPLUS COPYRIGHT 2008 ACS ON STN

ACCESSION NUMBER: 2008:243406 CAPLUS

DOCUMENT NUMBER: 148:428758

TITLE: Influence of water on the activity and stability of activated Mg-Al hydrotalcites for the transesterification of tributyrin with methanol

AUTHOR(S): Xi, Yuanzhou; Davis, Robert J.
CORPORATE SOURCE: Department of Chemical Engineering, University of Virginia, Charlottesville, VA, 22904-4741, USA

SOURCE: Journal of Catalysis (2008), 254(2), 190-197
CODEN: JCTLA5; ISSN: 0021-9517

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Magnesium-aluminum hydrotalcite with Mg/Al molar ratio of 4 was synthesized by copptn. method. Thermally-decomposed and rehydrated Mg-Al hydrotalcites were used to catalyze the transesterification of tributyrin, a model triglyceride, with methanol (tributyrin:methanol molar ratio 1:30) at 333 K to produce Me butyrate, monobutyrin, dibutyrin, and glycerol. The pseudo first order rate consts. of a three step reaction sequence for tributyrin transesterification were determined by fitting a kinetic model to the exptl. data. Although decomposed and rehydrated Mg-Al hydrotalcite was one order of magnitude more active than decomposed Mg-Al hydrotalcite based on surface area measured by N_2 adsorption, the activity correlated well to the CO_2 adsorption capacity. The most active rehydrated samples also deactivated faster, presumably because butyric acid produced by hydrolysis of ester with adsorbed water reacted with the base sites. The areal rate and CO_2 adsorption capacity of decomposed-rehydrated Mg-Al hydrotalcite decreased as the interlayer water was removed by heating.

REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 3 OF 29 CAPLUS COPYRIGHT 2008 ACS ON STN

ACCESSION NUMBER: 2007:556937 CAPLUS

DOCUMENT NUMBER: 147:192704

TITLE: Structure-activity relations in Cs-doped heteropolyacid catalysts for biodiesel production

AUTHOR(S): Narasimharao, K.; Brown, D. R.; Lee, A. F.; Newman, A. D.; Siril, P. F.; Tavener, S. J.; Wilson, K.
 CORPORATE SOURCE: Department of Chemistry, University of York, Heslington, York, YO10 5DD, UK
 SOURCE: Journal of Catalysis (2007), 248(2), 226-234
 CODEN: JCTLA5; ISSN: 0021-9517
 PUBLISHER: Elsevier Ltd.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB Insol. heteropolytungstate (H3PW12O40 HPW) salts, CsxH3-xPW12O40 (x = 0.9-3), were synthesized and characterized using a range of bulk and surface sensitive probes including N2 porosimetry, powder XRD, FTIR, XPS, 31P MASNMR, and NH3 calorimetry. Materials with Cs content in the range x = 2.0-2.7 were composed of dispersed crystallites with surface areas .apprx.100 m2 g-1 and high Brønsted acid strengths [AH0ads(NH3) = -150 kJ mol-1], similar to the parent heteropoly acid. The number of accessible surface acid sites probed by α -pinene isomerization correlated well with those determined by NH3 adsorption calorimetry and surface area measurements. CsxH3-xPW12O40 were active toward the esterification of palmitic acid and transesterification of tributyrin , important steps in fatty acid and ester processing for biodiesel synthesis. Optimum performance occurs for Cs loadings of x = 2.0-2.3, correlating with the accessible surface acid site d. These catalysts were recoverable with no leaching of soluble HPW.
 REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2006:766115 CAPLUS
 DOCUMENT NUMBER: 146:227765
 TITLE: Kinetic resolution of (R,S)-1,2-O-isopropylidene glycerol by esterification with dry mycelia of moulds
 AUTHOR(S): Romano, Diego; Ferrario, Valerio; Molinari, Francesco; Gardossi, Lucia; Montero, Jose Maria Sanchez; Torre, Paolo; Converti, Attilio
 CORPORATE SOURCE: Dipartimento di Scienze e Tecnologie Alimentari e Microbiologiche, Università degli Studi di Milano, Milan, 20133, Italy
 SOURCE: Journal of Molecular Catalysis B: Enzymatic (2006), 41(3-4), 71-74
 CODEN: JMCEF8; ISSN: 1381-1177
 PUBLISHER: Elsevier B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 146:227765
 AB The esterification of (R, S)-1,2-O-isopropylidene glycerol catalyzed by dry mycelia of different molds in organic solvent was studied. Dry mycelium of *Rhizopus oryzae* CBS 112.07 and *Aspergillus oryzae* MIM gave the (R)-ester with moderate optical purity; the kinetic data of the esterification with butyric acid in n-heptane showed an enantiomeric ratio of 3.4 with *Rhizopus oryzae* and 8.0 with *Aspergillus oryzae*. The esterification catalyzed by *Aspergillus oryzae* was performed on larger scale (operative volume 2.3 l) allowing for the production of 2.3 g l-1 of (R)-IPG butyrate with an e.e. = 56% and a molar conversion of 52%. The enantiomerically enriched ester was hydrolyzed with thermally-treated cells of *Bacillus coagulans*: the (S)-ester was obtained as

enantiomerically pure mol., while the alc. was recovered with e.e. = 90%.
 REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 5 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2003:833451 CAPLUS
 DOCUMENT NUMBER: 140:110301
 TITLE: Optimization of enzymatically prepared hexyl
 butyrate by lipozyme IM-77
 AUTHOR(S): Chang, Shu-Wei; Shaw, Jei-Fu; Shieh, Chwen-Jen
 CORPORATE SOURCE: Institute of Bioscience and Biotechnology, National
 Taiwan Ocean University, Chi-lung, 202, Taiwan
 SOURCE: Food Technology and Biotechnology (2003), 41(3),
 237-242
 CODEN: FTBRFD; ISSN: 1330-9862
 PUBLISHER: University of Zagreb, Faculty of Food Technology and
 Biotechnology
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB The ability of immobilized lipase (Lipozyme IM-77) from Rhizomucor miehei
 to catalyze the transesterification of hexanol and
 tributyrin was investigated in this study. Response surface
 methodol. (RSM) and five-level-five-factor central composite rotatable
 design (CCRD) were employed to evaluate the effects of synthesis
 parameters, such as reaction time (2 to 10 h), temperature (25 to 65°),
 enzyme amount (10 to 50 %), substrate amount (in mol) ratio of
 tributyrin to hexanol (1:1 to 3:1), and added water content (0 to
 20 %), on percentage amount (in mol) conversion of hexyl butyrate
 by transesterification. Reaction time and enzyme amount were the
 most important variables and substrate amount (in mol) ratio had less effect
 on the percentage of amount (in mol) conversion. Based on canonical anal.,
 the optimum synthesis conditions were: reaction time 8.3 h, temperature
 50°, enzyme amount 42.7 %, substrate amount (in mol) ratio 1.8:1, and
 added water 12.6 %. The predicted value was 96.2 % and actual exptl.
 value 95.3 % of the amount (in mol) conversion.
 REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 6 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2003:533997 CAPLUS
 DOCUMENT NUMBER: 140:110146
 TITLE: Steryl and stanyl esters by solvent-free
 lipase-catalyzed esterification and
 transesterification in vacuo
 AUTHOR(S): Weber, Nikolaus; Weitkamp, Petra; Mukherjee, Kumar D.
 CORPORATE SOURCE: Federal Centre for Cereal, Potato and Lipid Research,
 Institute for Lipid Research, Muenster, Germany
 SOURCE: Fresenius Environmental Bulletin (2003), 12(6),
 517-522
 CODEN: FENBEL; ISSN: 1018-4619
 PUBLISHER: PSP - Parlar Scientific Publications
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 140:110146
 AB Sterols, stanols and steroids have been converted in high to near-quant.
 yields to the corresponding acyl esters via esterification with fatty
 acids and transesterification with Me esters of fatty acids or

triacylglycerols using immobilized lipases from *Candida rugosa*, *Rhizomucor miehei* (Lipozyme IM), *Candida antarctica* (lipase B, Novozym 435) and papaya (*Carica papaya*) latex as biocatalysts in vacuo (20–40 mbar) at 40°C (80°C for Lipozyme IM, Novozym 435 and papaya latex). The rates of conversions were markedly lower using papaya (*Carica papaya*) latex lipase as biocatalyst. High conversion rates observed in transesterification of sitostanol with Me oleate using Lipozyme IM was retained even after ten repeated uses of the biocatalyst. Cholesterol has been converted to cholesteryl butyrate and steroids (5 α -pregnan-3 β -ol-20-one or 5-pregnen-3 β -ol-20-one) to their propionic acid esters, both in good to high yields, via transesterification with tributyrin and tripropionin, resp., using *C. rugosa* lipase as biocatalyst. Transesterification of cholesterol with di-Me 1,8-octanedioate using Lipozyme IM in vacuo yielded methylcholesteryl 1,8-octanedioate (65%) and dicholesteryl 1,8-octanedioate (5%). Moreover, cholesterol was transesterified with Et dihydrocinnamate using Lipozyme IM to give cholesteryl dihydrocinnamate in moderate yield (56%), whereas the reaction of lanosterol with Me oleate gave lanosteryl oleate in low yield (14%). Sterols and stanols contained in raw tall oil and deodorizer distillate, obtained during fat refining, have been converted to their fatty acid esters via esterification/ transesterification in situ catalyzed by *C. rugosa* lipase.

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:781554 CAPLUS

DOCUMENT NUMBER: 134:86422

TITLE: Fatty acid steryl, stanyl, and steroid esters by esterification and transesterification in vacuo using *Candida rugosa* lipase as catalyst
 AUTHOR(S): Weber, Nikolaus; Weitkamp, Petra; Mukherjee, Kumar D.
 CORPORATE SOURCE: Institute for Biochemistry and Technology of Lipids H. P. Kaufmann-Institute, Federal Centre for Cereal Potato and Lipid Research, Muenster, D-48147, Germany
 SOURCE: Journal of Agricultural and Food Chemistry (2001), 49(1), 67-71

CODEN: JAFCAU; ISSN: 0021-8561

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 134:86422

AB Sterols (sitosterol, cholesterol, stigmasterol, ergosterol, and 7-dehydrocholesterol) and sitostanol were converted in high to near-quant. yields to the corresponding long-chain acyl esters via esterification with fatty acids or transesterification with Me esters of fatty acids or triacylglycerols using lipase from *Candida rugosa* as biocatalyst in vacuo (20–40 mbar) at 40°. Neither organic solvent nor water is added in these reactions. Under similar conditions, cholesterol was converted to cholesteryl butyrate and steroids (5 α -pregnan-3 β -ol-20-one or 5-pregnen-3 β -ol-20-one) were converted to their propionic acid esters, both in moderate to high yields, via transesterification with tributyrin and tripropionin, resp. Reaction parameters studied in esterification include the temperature

and

the molar ratio of the substrates as well as the amount and reuse properties of the *C. rugosa* lipase. Lipases from porcine pancreas, *Rhizopus*

arrhizus, and *Chromobacterium viscosum* are quite ineffective as biocatalysts for the esterification of cholesterol with oleic acid under the above conditions.

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 8 OF 29 CAPLUS COPYRIGHT 2008 ACS ON STN

ACCESSION NUMBER: 1999:652034 CAPLUS

DOCUMENT NUMBER: 132:32515

TITLE: Esterase and lipase activity in *Jatropha curcas* L. Seeds

AUTHOR(S): Staubmann, R.; Ncube, I.; Gubitz, G. M.; Steiner, W.; Read, J. S.

CORPORATE SOURCE: Department of Biotechnology, Graz University of Technology, Graz, 8010, Austria

SOURCE: Journal of Biotechnology (1999), 75(2,3), 117-126
CODEN: JBTD4; ISSN: 0168-1656

PUBLISHER: Elsevier Science Ireland Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Two new esterases (JEA and JEB) and a lipase (JL) were extracted from the seeds of *Jatropha curcas* L. Lipase activity was only found during germination of the seeds and increased to a maximum after 4 days of germination. All enzymes were most active in the alkaline range at around pH 8 and the purified (fractionated precipitation with ethanol and gel filtration) esterases were very stable at high temps. The mol. weight (SDS-PAGE) of both esterases was determined to be 21.6-23.5 kDa (JEA) and 30.2 kDa (JEB) and the isoelec. point was 5.7-6.1 for esterase JEA and 9.0 for esterase JEB. Most ions caused a neg. influence on the activity of both esterases. With p-nitrophenyl butyrate as a substrate, JEA showed a K_m of 0.02 mM and a V_{max} of 0.26 $\mu\text{mol mg}^{-1} \text{min}^{-1}$. Under the same conditions JEB showed a K_m of 0.07 mM and a V_{max} of 0.24 $\mu\text{mol mg}^{-1} \text{min}^{-1}$. Both esterases hydrolyzed tributyrin, nitrophenyl esters up to a chain length of C4 and naphthyl esters up to a chain length C6. In transesterification reactions, JL was found to be most active at very low water activities (0.2), and in high water activities, the lipase hydrolyzed triglycerides into conversions above 80%. The lipase hydrolyzed both short-chain and long-chain triglycerides at about the same rate but was inactive on alpha-methylbenzyl acetate. JL is a potentially useful biocatalyst in the hydrolysis of triglycerides in organic solvents.

REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 9 OF 29 CAPLUS COPYRIGHT 2008 ACS ON STN

ACCESSION NUMBER: 1999:453893 CAPLUS

DOCUMENT NUMBER: 131:239719

TITLE: Comparison of esterification and transesterification of fructose by porcine pancreas lipase immobilized on different supports

AUTHOR(S): Bagi, K.; Simon, L. M.

CORPORATE SOURCE: Department of Biochemistry, Jozsef Attila University, Szeged, H-6726, Hung.

SOURCE: Biotechnology Techniques (1999), 13(5), 309-312
CODEN: BTECE6; ISSN: 0951-208X

PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The syntheses of fructose butyrate with five different immobilized porcine pancreas lipases were studied in acetonitrile with butyric acid and tributyrin as acyl donors. The hydrolytic activities of the enzymes were measured during the syntheses. The highest transesterification yield was observed with the Celite-adsorbed enzyme (57%; 1.42 g fructose butyrate l-1), and this form displayed the greatest retention of hydrolytic activity (57%) after operation for 20 days.

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 10 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:79528 CAPLUS

DOCUMENT NUMBER: 130:233979

TITLE: Optimization of Pseudomonas cepacia lipase preparations for catalysis in organic solvents

AUTHOR(S): Secundo, Francesco; Spadaro, Simona; Carrea, Giacomo; Overbeeke, P. L. Antoine

CORPORATE SOURCE: Istituto di Biocatalisi e Riconoscimento Molecolare, Milan, 20131, Italy

SOURCE: Biotechnology and Bioengineering (1999), 62(5), 554-561

CODEN: BIBIAU; ISSN: 0006-3592

PUBLISHER: John Wiley & Sons, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The activity of different lipase (from Pseudomonas cepacia) forms, such as crude powder (crude PC), purified and lyophilized with PEG (PEG + PC), covalently linked to PEG (PEG-PC), cross-linked enzyme crystals (CLEC-PC), and immobilized in Sol-Gel-AK (Sol-Gel-AK-PC) was determined, at various water activities (aw), in carbon tetrachloride, benzene and 1,4-dioxane. The reaction of vinyl butyrate with 1-octanol was employed as a model and both transesterification (formation of 1-octyl butyrate) and hydrolysis (formation of butyric acid from vinyl butyrate) rates were determined. Both rates depended on the lipase form, solvent employed, and aw value. Hydrolysis rates always increased as a function of aw, while the optimum of aw for transesterification depended on the enzyme form and nature of the solvent. At proper aw, some lipase forms such as PEG + PC, PEG-PC, and Sol-Gel-AK-PC had a total activity in organic solvents (transesterification plus hydrolysis) which was close to (39 and 48%) or even higher than (130%) that displayed by the same amount of lipase protein in the hydrolysis of tributyrin-one of the substrates most commonly used as standard for the assay of lipase activity-in aqueous buffer.

Instead, CLEC-PC and crude PC were much less active in organic solvents (2 and 12%) than in buffer. The results suggest that enzyme dispersion and/or proper enzyme conformation (favored by interaction with PEG or the hydrophobic Sol-Gel-AK matrix) are essential for the expression of high lipase activity in organic media.

REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L4 ANSWER 11 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:582512 CAPLUS
 DOCUMENT NUMBER: 129:275625
 ORIGINAL REFERENCE NO.: 129:56201a,56204a
 TITLE: Resolution of 2-alkanols by microbially-catalyzed esterification
 AUTHOR(S): Molinari, Francesco; Mantegazza, Laura; Villa, Raffaella; Aragozzini, Fabrizio
 CORPORATE SOURCE: Dipartimento di Scienze e Tecnologie Alimentari e Microbiologiche, Sezione Microbiologia Industriale, Università degli Studi di Milano, Milan, 20133, Italy
 SOURCE: Journal of Fermentation and Bioengineering (1998), 86(1), 62-64
 CODEN: JFBIEX; ISSN: 0922-338X
 PUBLISHER: Society for Fermentation and Bioengineering, Japan
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 129:275625
 AB A method based on the use of whole lyophilized microbial cells has been developed for resolution of 2-alkanols. Firstly, the esterification of racemic 2-octanol with butyric acid was studied. *Rhizopus oryzae* CBS 112-07 grown on Tween 80 was selected as a suitable biocatalyst. Appropriate choice of solvent, temperature and reactant concentration allowed for highly selective esterification (>97% enantiomeric excess of R-ester, 41% molar conversion). Direct esterification of 2-octanol with butyric acid was compared with transesterification using different acylating reagents. The best results were obtained with butyric acid and tributyrin. Esterification of other racemic 2-alkanols (2-butanol, 2-pentanol, 2-hexanol, 2-heptanol) showed that chain length played a crucial role in enantioselectivity, since lower enantiomeric excesses were observed using short chain alcs.
 REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 12 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1998:557377 CAPLUS
 DOCUMENT NUMBER: 129:276027
 ORIGINAL REFERENCE NO.: 129:56289a,56292a
 TITLE: Terpene ester production in a solvent phase using a reverse micelle-encapsulated lipase
 AUTHOR(S): Lee, Keith K. B.; Poppenborg, Ludger H.; Stuckey, David C.
 CORPORATE SOURCE: Department of Chemical Engineering and Chemical Technology, Imperial College of Science, Technology and Medicine, London, SW7 2BY, UK
 SOURCE: Enzyme and Microbial Technology (1998), 23(3/4), 252-260
 CODEN: EMTE2; ISSN: 0141-0229
 PUBLISHER: Elsevier Science Inc.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 129:276027
 AB The synthesis of terpene esters was studied using a *Candida rugosa* lipase encapsulated in an AOT-reverse-micellar solution. Three terpene alcs., geraniol, citronellol, and menthol and three triacylglycerols, tributyrin, tricaprylin, and triacetin were investigated as substrates for the transesterification. Geraniol and

tributyrin were found to be the best substrates to form the terpene ester in a water/AOT/isooctane reverse micellar solution. To obtain higher conversion yields of geraniol, the reaction parameters such as solvent type, enzyme and surfactant concentration, pH, W_o , and substrate concentration and ratio were investigated. It was concluded that enzyme deactivation in the reverse micelle was the main factor leading to suboptimal conversions. For a geraniol concentration of 100 mM, the highest extent of conversion of geraniol in a 500 mM AOT-reverse-micellar solution at pH 7 and $W_o = 11$ at 30°C was about 70%; however, the stability of the entrapped lipase under these conditions was low; the activity level for the *C. rugosa* lipase entrapped in reverse micelles dropped precipitously to about 10% within 24 h.

REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 13 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1997:262755 CAPLUS

DOCUMENT NUMBER: 126:342503

ORIGINAL REFERENCE NO.: 126:66603a,66606a

TITLE: Lipase PS-catalyzed transesterification of citronellyl butyrate and geranyl caproate: effect of reaction parameters

AUTHOR(S): Yee, Lisa N.; Akoh, Casimir C.; Phillips, Robert S.

CORPORATE SOURCE: Dep. Food Sci. Technol., Univ. Georgia, Athens, GA, 30602-7610, USA

SOURCE: Journal of the American Oil Chemists' Society (1997), 74(3), 255-260

CODEN: JAOCA7; ISSN: 0003-021X

PUBLISHER: AOCS Press

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 126:342503

AB *Pseudomonas* sp. lipase PS was immobilized by adsorption and tested for its ability to catalyze the synthesis of citronellyl butyrate and geranyl caproate by transesterification in n-hexane. The reaction parameters investigated were: enzyme load, effect of substrate concentration, added water, temperature, time course, organic solvent, pH memory, and enzyme reuse. Yields as high as 96 and 99% were obtained for citronellyl butyrate and geranyl caproate, resp., with 300 units (approx. 15% weight/weight of reactants) of lipase PS. Increasing amts. of terpene alc. inhibited lipase activity, while excess acyl donor (triacylglycerol) concentration enhanced ester production. Optimal yields were obtained at temps. from

30-50° after 24-h incubation time. Yields of 90 and 99% were obtained for citronellyl and geranyl esters, resp., with 2% added water. Solvents with log P values ≥ 2.5 showed the highest conversion yields. PH 7 and 6-8 seemed to be ideal for citronellyl butyrate and geranyl caproate, resp. The lipase remained active after reusing 12 times.

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 14 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1995:659267 CAPLUS

DOCUMENT NUMBER: 123:78352

ORIGINAL REFERENCE NO.: 123:13843a,13846a
 TITLE: Probing a functional role of Glu87 and Trp89 in the lid of Humicola lanuginosa lipase through transesterification reactions in organic solvent
 AUTHOR(S): Holmquist, Mats; Clausen, Ib Groth; Patkar, Shamkant; Svendsen, Allan; Hult, Karl
 CORPORATE SOURCE: Dep. of Biochemistry and Biotechnology, Royal Inst. of Technology, Stockholm, S-100 44, Swed.
 SOURCE: Journal of Protein Chemistry (1995), 14(4), 217-24
 CODEN: JPCHD2; ISSN: 0277-8033
 PUBLISHER: Plenum
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB To reveal the functional role of Glu87 and Trp89 in the lid of Humicola lanuginosa lipase, site-directed mutagenesis at Glu87 and Trp89 was carried out. The catalytic performance of wild-type and mutated lipases was studied in transesterification reactions in cyclohexane at a controlled water activity. Two different acyl donors were used in the investigation: tributyrin, a natural substrate for a lipase, and vinyl butyrate, an activated ester suitable for fast and efficient lipase-catalyzed transformations in preparative organic synthesis. As acyl acceptor 1-heptanol was used. The Glu87Ala mutation decreased the V_{max,app} value with tributyrin and vinyl butyrate by a factor of 1.5 and 2, resp. The K_{m,app} for tributyrin was not affected by the Glu87Ala mutation, but the K_{m,app} for vinyl butyrate increased twofold compared to the wild-type lipase. Changing Trp89 into a Phe residue afforded an enzyme with a 2.7- and 2-fold decreased V_{max,app} with the substrates tributyrin and vinyl butyrate, resp., compared to the wild-type lipase. No significant effects on the K_{m,app} values for tributyrin or vinyl butyrate were seen as a result of the Trp89Phe mutation. However, the introduction of a Glu residue at position 89 in the lid increased the K_{m,app} for tributyrin and vinyl butyrate by a factor of >5 and 2, resp. The Trp89Glu mutated lipase could not be saturated with tributyrin within the exptl. condition (0-680 mM) studied here. With vinyl butyrate as a substrate the V_{max,app} was only 6% of that obtained with wild-type enzyme.

L4 ANSWER 15 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1994:319295 CAPLUS
 DOCUMENT NUMBER: 120:319295
 ORIGINAL REFERENCE NO.: 120:56045a,56048a
 TITLE: Lipase-catalyzed synthesis of terpene esters by transesterification in n-hexane
 AUTHOR(S): Claon, Paul A.; Akoh, Casimir C.
 CORPORATE SOURCE: Dep. Food Sci. Technol., Univ. Georgia, Athens, GA, 30602-7610, USA
 SOURCE: Biotechnology Letters (1994), 16(3), 235-40
 CODEN: BILED3; ISSN: 0141-5492
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 120:319295
 AB Short chain fatty acid of geraniol and citronellol were synthesized by lipase-catalyzed transesterification with yields as high as 98% molar conversion. Triacylglycerols were the best substrates and immobilized Candida antarctica lipase, SP435 gave the highest overall

yields. The lipases tested successfully accommodated novel acyl donors such as isopropenyl acetate and glycidyl butyrate.

L4 ANSWER 16 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1992:255146 CAPLUS

DOCUMENT NUMBER: 116:255146

ORIGINAL REFERENCE NO.: 116:43251a, 43254a

TITLE: Solvent effect on *Pseudomonas* sp. lipase catalyzed transesterification between tributyrin and 2-octanol in organic solvents

AUTHOR(S): Hirata, Hirofumi; Sakaki, Keiji; Yamashina, Takao; Higuchi, Katsuhiko; Yanagishita, Hiroshi; Iida, Isao; Toyota, Koji; Sugiura, Masaaki

CORPORATE SOURCE: Natl. Chem. Lab. Ind., Tsukuba, 305, Japan

SOURCE: Chemistry Express (1992), 7(4), 293-6

CODEN: CHEXEU; ISSN: 0911-9566

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The lipase-catalyzed transesterification of tributyrin with (\pm)-2-octanol gave octyl (R)-2-butyrate and 1,2-dibutyrin. The solvent effect on this reaction was investigated. The highest enantioselectivity was observed with 1,2-dichloroethane, although the rate of reaction was slow; (S)-2-octanol was recovered from this reaction.

L4 ANSWER 17 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1992:143093 CAPLUS

DOCUMENT NUMBER: 116:143093

ORIGINAL REFERENCE NO.: 116:23919a, 23922a

TITLE: Determination of enantiomer content of secondary alkanol as diastereomeric N-[1-(1-naphthyl)ethyl]carbamate by normal phase HPLC (high performance liquid chromatography)

AUTHOR(S): Hirata, Hirofumi; Yamashina, Takao; Higuchi, Katsuhiko; Sakaki, Keiji; Iida, Isao

CORPORATE SOURCE: Natl. Chem. Lab. Ind., Tsukuba, 305, Japan

SOURCE: Yukagaku (1991), 40(11), 995-1001

CODEN: YKGKAM; ISSN: 0513-398X

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 116:143093

AB The enantiomer content of secondary alkanol (1) was determined by normal-phase HPLC using (R)-(-)- and (S)-(+)-1-(1-naphthyl)ethyl isocyanates [(R)-NEI and (S)-NEI] as chiral resolving reagents. Alc. (1) reacted with NEI to give the corresponding diastereomeric carbamate (2), which was separated on achiral stationary phases. In the case of (R)-NEI, the (S) isomer of (1) was eluted more quickly than its (R) isomer, and vice versa for (S)-NEI. Separation factors decreased as the position of the hydroxyl group of (1) was close to the center of the carbon chain of (1). By the present method, determination was also made of the optical purity of 2-alkyl butyrate formed by lipase-catalyzed transesterification between tributyrin (tributyrin glycerol) and 2-alkanol in an organic solvent. The optical purity of the butyrate as determined by the above method showed good agreement with that found by optical rotation.

L4 ANSWER 18 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1991:602622 CAPLUS

DOCUMENT NUMBER: 115:202622

ORIGINAL REFERENCE NO.: 115:34477a,34480a
 TITLE: Comparison of enzymic hydrolysis and synthesis of esters of optically active (4R)-2-methoxycarbonylmethyl-4-hydroxy-2-cyclopenten-1-one using the *Penicillium solitum* lipase
 AUTHOR(S): Veinberga, I.; Freimanis, J.; Kazoka, H.
 CORPORATE SOURCE: Inst. Org. Synth., Riga, USSR
 SOURCE: *Bioorganicheskaya Khimiya* (1991), 17(6), 760-6
 CODEN: BIKHD7; ISSN: 0132-3423
 DOCUMENT TYPE: Journal
 LANGUAGE: Russian
 OTHER SOURCE(S): CASREACT 115:202622
 AB Enzymic hydrolysis of (4R,S)-2-methoxycarbonylmethyl-4-hydroxy-2-cyclopenten-1-one esters and their enzymic synthesis via direct esterification or transesterification in organic solvents using a small amount of water and lipase from *P. solitum* were studied. The structure of the ester's acyl moiety (or) of the carboxylic acids used for their synthesis and containing 2-18 C atoms affects the enantioselectivity of both hydrolysis and synthesis. With use of vinyl acetate, the enantioselectivity of synthesis is twice as high as that of hydrolysis of the corresponding acetyl derivative. In both cases, the R-enantiomer reacts faster. This allows raising the optical purity of (4R)-2-methoxycarbonylmethyl-4-hydroxy-2-cyclopenten-1-one by alternating the reactions of enzymic synthesis and hydrolysis.

L4 ANSWER 19 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1991:553662 CAPLUS
 DOCUMENT NUMBER: 115:153662
 ORIGINAL REFERENCE NO.: 115:26183a,26186a
 TITLE: Hydrolysis and synthesis of butyrylglycerols by lipases
 AUTHOR(S): Otero, Cristina; Pastor, Eitel; Rua, Maria L.; Ballesteros, Antonio
 CORPORATE SOURCE: Inst. Catal., Span. Res. Council, Madrid, 28006, Spain
 SOURCE: *Annals of the New York Academy of Sciences* (1990), 613(Enzyme Eng. 10), 523-8
 CODEN: ANYAA9; ISSN: 0077-8923
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB In the present work the time course of the hydrolysis of tributyrin by several immobilized lipases was investigated as a function of the hydrophilicity of the support. In addition, the transesterification between Et butyrate and glycerol, using different lipase preps. (soluble, immobilized, modified), has been studied. The acylation has proven to be very selective; only monobutyrin has been produced.

L4 ANSWER 20 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1990:528527 CAPLUS
 DOCUMENT NUMBER: 113:128527
 ORIGINAL REFERENCE NO.: 113:21733a,21736a
 TITLE: Lipase-catalyzed transesterification in organic solvent: effects of water and solvent, thermal stability and some applications
 AUTHOR(S): Hirata, Hirofumi; Higuchi, Katsuhiko; Yamashina, Takao
 CORPORATE SOURCE: Natl. Chem. Lab. Ind., Tsukuba, Japan
 SOURCE: *Journal of Biotechnology* (1990), 14(2), 157-67

DOCUMENT TYPE: JOURNAL
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 113:128527

AB The lipase-catalyzed transesterification of tributyrin with various alcs. in a heterogeneous system was investigated using powdered enzyme suspended in numerous organic solvents. There was an optimum water content, (H₂O)_{op}, where the enzyme showed the maximal activity and its value was affected by the hydration of the enzyme and the substrate, coagulation of the enzyme, the nature (water-miscible/immiscible) of the solvent, and the water equilibrium between the enzyme and the substrate solution

In a water-restricted environment, *Pseudomonas* lipases were very stable and showed enzymic activities, parts of which were restored by water supplementation. This suggested that a thermally azeotropic dehydration plays a part in the thermal inactivation of the enzyme in organic solvents. The catalytic activity of the enzyme was predominantly determined by the polarity and the structure of the solvent, and the dehydration of the enzyme by the solvent. The reactivity of an aliphatic primary alc. bearing a straight chain was dependent on the nature of the solvent and differed from that for enzymic hydrolysis of the corresponding alkyl butyrate in aqueous solution. Investigations of the transesterification with 2-alkanol confirmed a synthetic strategy of the optically active esters and optical resolution of the alc.

L4 ANSWER 21 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1990:19941 CAPLUS

DOCUMENT NUMBER: 112:19941

ORIGINAL REFERENCE NO.: 112:3502h,3503a

TITLE: Enzymic process for manufacturing optically active

secondary alcohols having pyridine skeletons

INVENTOR(S): Kaneoya, Masakazu; Yoshida, Naoyuki; Uchida, Manabu

PATENT ASSIGNEE(S): Chisso Corp., Japan

SOURCE: Eur. Pat. Appl., 6 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

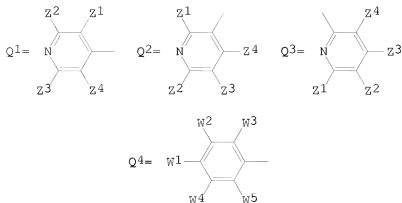
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 304706	A2	19890301	EP 1988-112789	19880805
EP 304706	A3	19900704		
EP 304706	B1	19921119		
R: CH, DE, FR, GB, IT, LI				
JP 01060398	A	19890307	JP 1987-212674	19870828
US 4971909	A	19901120	US 1988-227248	19880802
PRIORITY APPLN. INFO.:			JP 1987-212674	A 19870828
OTHER SOURCE(S):	MARPAT	112:19941		

GI



AB A process for producing the title compds. comprises use of a hydrolase under substantially anhydrous conditions to catalyze the reaction between an ester and (R,S)-X(Rn)CH(AMy)(OH) [I; X = Q1, Q2, Q3, Q4 (Z1-4, W1-5 = H, halogen, CN, CF3, NH2, alkylamino, C1-20 alkyl or alkoxy); Y = H, halogen, CN, CF3; R, A = C1-20 alkylene; M, n = 0, 1]. After the transesterification reaction, the R- or S-secondary alc. and S- or R-ester are separated and purified. Lipase P 3, (R,S)-1-(4-pyridyl)ethanol 7.3, and tributyrin 19.7 g were stirred 6 days at 35°.

The enzyme was removed by filtration, the filtrate was concentrated by distillation under reduced pressure, and S-(-)-1-(4-pyridyl) ethanol 3.0 g (82.6% yield) and R-1-(4-pyridyl)ethyl butyrate were obtained by column chromatog. The ester was hydrolyzed to prepare R-(+)-1-(4-pyridyl)ethanol 1.8 g (49.5% yield).

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L4 ANSWER 21 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1990:19941 CAPLUS

DOCUMENT NUMBER: 112:19941

ORIGINAL REFERENCE NO.: 112:3502h,3503a

TITLE: Enzymic process for manufacturing optically active secondary alcohols having pyridine skeletons

INVENTOR(S): Kaneoya, Masakazu; Yoshida, Naoyuki; Uchida, Manabu

PATENT ASSIGNEE(S): Chisso Corp., Japan

SOURCE: Eur. Pat. Appl., 6 pp.

CODEN: EPXXDW

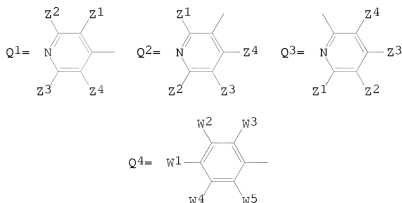
DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 304706	A2	19890301	EP 1988-112789	19880805
EP 304706	A3	19900704		
EP 304706	B1	19921119		
R: CH, DE, FR, GB, IT, LI				
JP 01060398	A	19890307	JP 1987-212674	19870828
US 4971909	A	19901120	US 1988-227248	19880802
PRIORITY APPLN. INFO.:			JP 1987-212674	A 19870828
OTHER SOURCE(S):	MARPAT 112:19941			
GI				



AB A process for producing the title compds. comprises use of a hydrolase under substantially anhydrous conditions to catalyze the reaction between an ester and (R,S)-X(Rn)CH(AMy)(OH) [I; X = Q1, Q2, Q3, Q4 (Z1-4, W1-5 = H, halogen, CN, CF3, NH2, alkylamino, C1-20 alkyl or alkoxy); Y = H, halogen, CN, CF3; R, A = C1-20 alkylene; M, n = 0, 1]. After the transesterification reaction, the R- or S-secondary alc. and S- or R-ester are separated and purified. Lipase P 3, (R,S)-1-(4-pyridyl)ethanol 7.3, and tributyrin 19.7 g were stirred 6 days at 35°. The enzyme was removed by filtration, the filtrate was concentrated by distillation under reduced pressure, and S-(-)-1-(4-pyridyl) ethanol 3.0 g (82.6% yield) and R-1-(4-pyridyl)ethyl butyrate were obtained by column chromatog. The ester was hydrolyzed to prepare R-(+)-1-(4-pyridyl)ethanol 1.8 g (49.5% yield).

L4 ANSWER 22 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1989:495630 CAPLUS

DOCUMENT NUMBER: 111:95630

ORIGINAL REFERENCE NO.: 111:16077a,16080a

TITLE: Enzymic process for producing optically active secondary alcohols

INVENTOR(S): Yoshida, Naoyuki; Kaneoya, Masakazu; Uchida, Manabu; Morita, Hiroshi

PATENT ASSIGNEE(S): Chisso Corp., Japan

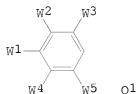
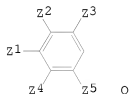
SOURCE: Eur. Pat. Appl., 6 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 288994	A2	19881102	EP 1988-106737	19880427
EP 288994	A3	19891123		
EP 288994	B1	19920722		
R: CH, DE, FR, GB, IT, LI				
JP 63273499	A	19881110	JP 1987-106276	19870501
JP 2707076	B2	19980128		
US 4962031	A	19901009	US 1988-189163	19880502
PRIORITY APPLN. INFO.:			JP 1987-106276	A 19870501
OTHER SOURCE(S):	CASREACT 111:95630; MARPAT 111:95630			
GI				



AB Optically active compds. are manufactured by reacting an ester under substantially anhydrous conditions with (R,S)-Y(R)nCH(CH₂X)(OH) [I; X = halo, cyano; Y = halo, cyano, trifluoromethyl, amino alkylamino, alkylalkoxycarbonyl, Q, Q1 (Z1-5, W1-5 = H, halo, cyano, trifluoromethyl, amino, alkylamino, alkyl, alkoxy having 1-20 C; Z1-5 = aryloxy); R = C1-20 alkylene; n = 0, 1] in the presence of hydrolase, via transesterification. (R,S)-2-Chloro-1-phenylethanol 7.9 and tributyrin 17.8 g were reacted at 35° for 16 days to obtain 4 g of (R)-2-chloro-1-phenylethanol and (S)-2-chloro-1-phenylethyl butyrate (II). Optically pure (S)-chloro-1-phenylethanol (yield 23%, >99% ee) was obtained by acidic hydrolysis of II.

L4 ANSWER 23 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1989:435782 CAPLUS

DOCUMENT NUMBER: 111:35782

ORIGINAL REFERENCE NO.: 111:6061a,6064a

TITLE: Preparation of immobilized enzymes, the enzymes obtained, and method for performing enzymatic reactions using the immobilized enzymes

PATENT ASSIGNEE(S): Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, Neth.

SOURCE: Neth. Appl., 8 pp.

CODEN: NAXXAN

DOCUMENT TYPE: Patent

LANGUAGE: Dutch

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
NL 8700269	A	19880901	NL 1987-269	19870204
PRIORITY APPLN. INFO.:			NL 1987-269	19870204

AB An immobilized enzyme is prepared by mixing ≥ 1 enzymes with an ungelled or partially gelled 20-60 weight % starch sol, gelation, forming into desired dry, wet, or reswelled shapes, dewatered with a 1st solvent that is both water miscible and miscible with water-immiscible solvents, and treatment with a 2nd water-immiscible solvent to remove the 1st solvent. These enzymes are suitable for performing enzyme reactions in water-immiscible solvents in which many substrates have a higher solubility than in water, allowing e.g. reactions with hydrolysis-sensitive products. Immobilized lipase granules (2.5 g) were swelled in 5 g water for 90 min. The swollen granules were then washed with absolute EtOH at 4° until the d. of the EtOH had reached its initial value. The granules were then washed with C7H16 to obtain a storable product. Next, 75 g amylose ether (Arebe H 15 VZ) were kneaded at 100° with 175 g 0.02M phosphate buffer (pH 7) for 1.5 h to obtain a homogeneous soluble After slowly cooling to 50°, 15 g lipase solution (Novo, SP225, amylase-free) were added. The mixture was allowed to cool and then extruded. The extrudate was dried at 20° and granulated to obtain 0.6-mm granules. Next, 1 g granules was added to 10 mL of a solution of 10mM tributyrin and 10 mM hexanol in heptane. The transesterification was carried out at 50° and resulted in the formation of 0.36 μ mol hexyl butyrate/mg protein. After 8 h, the reaction mixture was replaced by heptane and the catalyst was stored at 50°. The activity remained undiminished for 10 days.

L4 ANSWER 24 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1989:134841 CAPLUS
 DOCUMENT NUMBER: 110:134841
 ORIGINAL REFERENCE NO.: 110:22247a,22250a
 TITLE: Enzyme reaction in organic solvent. II. Preparation of substituted benzyl butyrates by lipase catalyzed transesterification between tributyrin and the corresponding benzyl alcohols
 AUTHOR(S): Higuchi, Katsuhiko; Hirata, Hirofumi
 CORPORATE SOURCE: Natl. Chem. Lab. Ind., Tsukuba, 305, Japan
 SOURCE: Yukagaku (1988), 37(8), 599-605
 CODEN: YKGMAM; ISSN: 0513-398X
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 110:134841

AB Lipase catalyzed transesterification between tributyrin (I) and substituted benzyl alcs. gave the corresponding benzyl butyrates. Six of 13 lipases which catalyzed the hydrolysis of triglycerides with short chain fatty acid residues showed good activities for transesterification. The reactivity of the benzyl alcs. with I varied according to enzyme source. The solvent effect was examined, and lipase activity was different for each solvent.

L4 ANSWER 25 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1988:133763 CAPLUS
 DOCUMENT NUMBER: 108:133763
 ORIGINAL REFERENCE NO.: 108:21937a,21940a

TITLE: Enzyme reaction in organic solvent. I. *Candida cylindracea* lipase catalyzed transesterification between tri-*n*-butyrin and 1-octanol in various organic solvents

AUTHOR(S): Hirata, Hirofumi; Higuchi, Katsuhiko

CORPORATE SOURCE: Natl. Chem. Lab. Ind., Yatabe, 305, Japan

SOURCE: Yukagaku (1987), 36(9), 643-9
CODEN: YK GKAM; ISSN: 0513-398X

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The *C. cylindracea* lipase-catalyzed transesterification between tri-*n*-butyrin (I) and 1-octanol (II) to give 1-octyl butyrate was studied in various organic solvents containing 0.75 M I and 0.67 M II at 30°. The rate of this reaction increased at first, went through a maximum, and then decreased with increasing water content. The water content at the maximum rate, (H₂O)_{op}, for the reaction in a water-insol. solvent increased with enzyme concentration (H₂O)_{op} was invariable and independent of enzyme concentration for the reaction in water-soluble solvents. The rate in the presence of (H₂O)_{op} was measured and transesterification was dominated by the structure and polarity of the solvent.

L4 ANSWER 26 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1988:75022 CAPLUS

DOCUMENT NUMBER: 108:75022

ORIGINAL REFERENCE NO.: 108:12395a,12398a

TITLE: Enzyme reaction in apolar solvents: the resolution of (±)-sulcatol with porcine pancreatic lipase

AUTHOR(S): Stokes, Thomas M.; Oehlschlager, Allan C.

CORPORATE SOURCE: Dep. Chem., Simon Fraser Univ., Burnaby, BC, V5A 1S6, Can.

SOURCE: Tetrahedron Letters (1987), 28(19), 2091-4
CODEN: TELEAY; ISSN: 0040-4039

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 108:75022

AB The enantioselectivity of the transesterification of (±)-sulcatol by porcine pancreatic lipase in ether is increased ten-fold by dehydration of the enzyme and use of 2,2,2-trifluoroethyl laurate as the transesterifying ester.

L4 ANSWER 27 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1987:574445 CAPLUS

DOCUMENT NUMBER: 107:174445

ORIGINAL REFERENCE NO.: 107:27987a,27990a

TITLE: Selective esterification in polyols

INVENTOR(S): Godtfredsen, Sven Erik; Bundgaard, Peter; Andresen, Otto

PATENT ASSIGNEE(S): Novo Industri A/S, Den.

SOURCE: PCT Int. Appl., 24 pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 8605186      A1      19860912      WO 1986-DK17      19860227
W:  AU, BB, BG, BR, DK, FI, HU, JP, KP, KR, LK, MC, MG, MW, NO, RO,
   SD, SU, US
RW: AT, BE, CF, CG, CH, CM, DE, FR, GA, GB, IT, LU, ML, MR, NL, SE,
   SN, TD, TG
DK 8500877      A      19860828      DK 1985-877      19850227
DK 8505147      A      19860828      DK 1985-5147     19851107
DK 157308      B      19891204
DK 157308      C      19900507
AU 8655457      A      19860924      AU 1986-55457     19860227
AU 601678      B2     19900920
EP 215038      A1     19870325      EP 1986-901364    19860227
EP 215038      B1     19890809
R:  AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE
JP 62502375    T      19870917      JP 1986-501411    19860227
AT 45362      T      19890815      AT 1986-901364    19860227
PRIORITY APPLN. INFO.:
DK 1985-877      A      19850227
DK 1985-5147     A      19851107
EP 1986-901364   A      19860227
WO 1986-DK17     A      19860227

OTHER SOURCE(S):      CASREACT 107:174445; MARPAT 107:174445
AB  Selective esterification of only one of the hydroxy groups in polyols is
   achieved by an enzyme catalyzed esterification of acetalized or ketalized
   polyols, e.g. carbohydrates and glycerides, or by concomitant
   acetalization or ketalization of the polyols and esterification of a ketal
   or acetal in the presence of an enzyme. Thus, a mixture of 3 equiv
   Me(CH2)3CO2Me and 100 mmol 1,2:5,6-di-O-isopropylidene-D-glucosylfuranose in
   25 mL phosphate buffer and 25 mL hexane containing a freeze dried powder of
   Candida lipase was stirred vigorously at 30° for 24 h to give 10%
   4-O-butyryl-1,2:5,6-di-O-isopropylidene-D-glucose.

L4  ANSWER 28 OF 29  CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER:      1987:552826  CAPLUS
DOCUMENT NUMBER:        107:152826
ORIGINAL REFERENCE NO.: 107:24585a,24588a
TITLE:                  Lipase-catalyzed transesterification between
                        tri-n-butyryl and aliphatic primary alcohols in neat
                        Higuchi, Katsuhiko; Yamashina, Takao; Ishikawa,
                        Kazuhiko; Hirata, Hirofumi
AUTHOR(S):              Natl. Chem. Lab. Ind., Ibaraki, Japan
CORPORATE SOURCE:       Yukagaku (1987), 36(5), 355-61
SOURCE:                  CODEN: YKGKAM; ISSN: 0513-398X
DOCUMENT TYPE:          Journal
LANGUAGE:               Japanese
AB  Lipase-catalyzed transesterification between tri-n-butyryl and
   C6-C11 aliphatic primary alcs. to give the corresponding alkyl
   butyrates was studied. Six of 13 lipases, from Candida
   cylindraceae, Pseudomonas fluorescens, Pseudomonas sp., Penicillium
   cyclopium, Penicillium roquefortii, and porcine pancreas, showed good
   reactivity. The lipases were classified into 3 types according to the
   manner in which they were affected by water. Temperature optima ranged from
   90° for the lipases from the 2 Pseudomonas sp. to 30° for P.
   roquefortii lipase. The addition of butyric acid caused no significant
   change in the rates. The thermal stability of Pseudomonas lipase in
   tributyryl was also examined

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L4 ANSWER 29 OF 29 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1984:205525 CAPLUS

DOCUMENT NUMBER: 100:205525

ORIGINAL REFERENCE NO.: 100:31149a,31152a

TITLE: Preparative production of optically active esters and alcohols using esterase-catalyzed stereospecific transesterification in organic media

AUTHOR(S): Cambou, Bernard; Klihanov, Alexander M.

CORPORATE SOURCE: Dep. Nutr. Food Sci., Massachusetts Inst. Technol., Cambridge, MA, 02139, USA

SOURCE: Journal of the American Chemical Society (1984), 106(9), 2687-92

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 100:205525

AB A novel enzymic approach to the production of optically active alcs. and esters from racemates was developed that involves the use of esterase-catalyzed transesterifications carried out in biphasic aqueous-organic mixts. Water-insol. substrates constitute the organic phase,

while the enzyme is located in the aqueous phase. Since the fraction of the latter phase can be made very low, such an arrangement solves the problem of both the competition of an alc. (the nucleophile) with water in the enzymic reaction and poor solubility of most organic esters and alcs. in water. By use of

porous supports (Sephacrose or Chromosorb) filled with aqueous solns. of hog liver carboxyl esterase as a stereoselective catalyst and Me propionate as a matrix ester, the following optically active alcs. and their propionic esters were produced on a preparative scale: 3-methoxy-1-butanol, 3-methyl-1-pentanol, 3,7-dimethyl-1-octanol, and β -citronellol. To overcome a rather narrow substrate specificity of hog liver carboxyl esterase, a nonspecific lipase from yeast (*Candida cylindracea*) also was employed as a stereoselective transesterification catalyst. By using an aqueous solution of this enzyme confined to the pores of Chromosorb

and tributyrin as a matrix ester, gram amts. of the following optically active alcs. and their butyric esters were prepared: 2-butanol, sec-phenethyl alc., 2-octanol, 1-chloro-2-propanol, and 2,3-dichloro-1-propanol (subsequently nonenzymically converted to optically active propylene oxide and epichlorohydrin, resp.), 6-methyl-5-hepten-2-ol, and 1,2-butanediol.

=> d his

(FILE 'HOME' ENTERED AT 08:18:26 ON 19 SEP 2008)

FILE 'CAPLUS' ENTERED AT 08:19:28 ON 19 SEP 2008

L1 0 S LOWER (2W) ALKYL (2W) TRIGLYCERIDE (2W) ESTER
 L2 1984 S TRIBUTYRIN
 L3 95 S L2 AND TRANSESTERIFICATION
 L4 29 S L3 AND BUTYRATE

=> s triacetin (L) transesterification (L) (methyl (2w) acetate)
 3411 TRIACETIN
 6 TRIACETINS

3415 TRIACETIN
 (TRIACETIN OR TRIACETINS)
 22238 TRANSESTERIFICATION
 305 TRANSESTERIFICATIONS
 22303 TRANSESTERIFICATION
 (TRANSESTERIFICATION OR TRANSESTERIFICATIONS)
 1069304 METHYL
 717 METHYLS
 1069736 METHYL
 (METHYL OR METHYLS)
 979784 ME
 11297 MES
 986990 ME
 (ME OR MES)
 1699545 METHYL
 (METHYL OR ME)
 573755 ACETATE
 30110 ACETATES
 586163 ACETATE
 (ACETATE OR ACETATES)
 L5 7 TRIACETIN (L) TRANSESTERIFICATION (L) (METHYL (2W) ACETATE)

=> d 15 1-7 ibib abs

L5 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:163547 CAPLUS

DOCUMENT NUMBER: 148:406182

TITLE: Low Boiling Point Organic Amine-Catalyzed
 Transesterification for Biodiesel Production
 AUTHOR(S): Zhang, Lixiong; Guo, Weijun; Liu, Dan; Yao, Jianfeng;
 Ji, Lei; Xu, Nanping; Min, Enze

CORPORATE SOURCE: State Key Laboratory of Materials-Oriented Chemical
 Engineering and College of Chemistry and Chemical
 Engineering, Nanjing University of Technology,
 Nanjing, 210009, Peop. Rep. China
 SOURCE: Energy & Fuels (2008), 22(2), 1353-1357
 CODEN: ENFUEM; ISSN: 0887-0624

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The transesterification of triacetin to Me
 acetate catalyzed by 11 kinds of low b.p. amines was examined at
 subcrit. methanol temperature as model reactions to simulate the biodiesel
 production. The branched amines showed higher yield of Me
 acetate than normal amines. For normal amines, the yield of
 Me acetate decreased with the increase of the carbon number
 of the amines. Three kinds of amines, i.e., isopropylamine,
 tert-butylamine, and triethylamine with b.ps. <90° and high
 activities in the above model reaction were, resp., applied to the
 transesterification of rapeseed oil or soybean oil with methanol
 to produce biodiesel. The process conditions, such as molar ratio of
 methanol to oil, reaction temperature, catalyst usage, and water content were
 studied. HPLC, GC, GC-MS, IR and 1H NMR were used to analyze the
 products. The yield of Me ester increased with the increase of the molar
 ratio of methanol to oil from 4:1 to 20:1, the reaction temperature from 60 to
 230°, and the catalyst content from 0 to 6%. The increase of the
 water content in the oil had a neg. effect on the yield of Me ester. The

yield of biodiesel could reach over 90% when the reaction carried out with a molar ratio of methanol to rapeseed oil of 20:1, a catalyst dosage of 3%, and at the reaction temperature of 230° for 6 to 8 h when using the three kinds of amines as catalysts. The possible reaction between the amines with oil was also examined. Small amts. of isopropylamine and tert-butylamine and trace amts. of triethylamine could react with oil under the reaction conditions studied.

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:188639 CAPLUS
DOCUMENT NUMBER: 146:423860
TITLE: Transesterification of triacetin using solid Bronsted bases
AUTHOR(S): Liu, Yijun; Lotero, Edgar; Goodwin, James G.; Lu, Changqing
CORPORATE SOURCE: Department of Chemical and Biomolecular Engineering, Clemson University, Clemson, SC, 29634, USA
SOURCE: Journal of Catalysis (2007), 246(2), 428-433
CODEN: JCTLA5; ISSN: 0021-9517
PUBLISHER: Elsevier Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 146:423860

AB Solid Bronsted base catalysts were evaluated as a potential alternative to homogeneous base catalysts in the transesterification of triacetin with small alcs. carried out under mild reaction conditions. Two catalysts with organic quaternary ammonium functionality (QN+OH-), a resin (A26), and a functionalized silica gel (QN+OH-/SiO2), were used for the transesterification of triacetin with methanol (a model reaction), and their performance was studied in detail. Reactions were carried out in a well-mixed isothermal batch reactor at 60°. Both solid bases showed appreciable catalytic activity for the transesterification of triacetin conforming to the base strength of the active centers. Although the polymeric organic catalyst showed lower site activity, it was more stable during multiple reaction cycles (i.e., showed less deactivation) than the silica-supported catalyst and exhibited a higher total selectivity for glycerol for a given triacetin conversion. The effect of the support on the Bronsted base catalyzed transesterification is discussed, as are probable routes for silica-supported catalyst deactivation.

REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:55584 CAPLUS
DOCUMENT NUMBER: 146:299013
TITLE: Transesterification of triacetin with methanol on Nafion acid resins
AUTHOR(S): Lopez, Dora E.; Goodwin, James G.; Bruce, David A.
CORPORATE SOURCE: Department of Chemical and Biomolecular Engineering, Clemson University, Clemson, SC, 29634, USA
SOURCE: Journal of Catalysis (2007), 245(2), 381-391
CODEN: JCTLA5; ISSN: 0021-9517
PUBLISHER: Elsevier Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Although homogeneous alkali catalysts (e.g., NaOH) are commonly used to produce biodiesel by transesterification of triglycerides (vegetable oils and animal fats) and methanol, solid acid catalysts, such as acidic resins, are attractive alternatives because they are easy to sep. and recover from the product mixture and also show significant activity in the presence of fatty acid impurities, which are common in low-cost feedstocks. To better understand solid acid catalyst performance, a fundamental transesterification kinetic study was carried out using triacetin and methanol on Nafion (perfluorinated-based ion-exchange resin) catalysts. In particular, Nafion SAC-13 (silica-supported Nafion) and Nafion NR50 (unsupported Nafion) were studied, because both show great promise for biodiesel-forming reactions. The reaction kinetics for a common homogeneous acid catalyst (H₂SO₄) were also determined for comparison. Liquid-phase reaction was performed at 60° using a stirred batch reactor. The swelling properties of the resin in solvents of diverse polarity that reflect soins. typically present in a biodiesel synthesis mixture were examined. The initial reaction rate was greatly affected by the extent of swelling of the resin, where, as expected, a greater effect was observed for Nafion NR50 than for the highly dispersed Nafion SAC-13. The reaction orders for triacetin and methanol on Nafion SAC-13 were 0.90 and 0.88, resp., similar to the reaction orders determined for H₂SO₄ (1.02 and 1.00, resp.). The apparent activation energy for the conversion of triacetin to diacetin was 48.5 kJ/mol for Nafion SAC-13, comparable to that for H₂SO₄ (46.1 kJ/mol). Selective poisoning of the Broensted acid sites on Nafion SAC-13 using pyridine before transesterification revealed that only one site was involved in the rate-limiting step. Probably reaction catalyzed by the ion-exchange resin can should be considered to follow a mechanism similar to that of the homogeneous catalyzed one, where protonated triglyceride (on the catalyst surface) reaction with methanol is the rate-limiting step.

REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2008 ACS ON SIN

ACCESSION NUMBER: 2006:32238 CAPLUS

DOCUMENT NUMBER: 145:11065

TITLE: Kinetics of transesterifications of triacetin with methanol or ethanol under supercritical state

AUTHOR(S): Ju, Qinghua; Guo, Weijun; Zhang, Lixiong; Xu, Nanping; Du, Zexue; Min, Enze

CORPORATE SOURCE: Coll. Chem. Chem. Eng. and Key Lab. Mater., Oriented Chem. Eng. of Jiangsu Province, Nanjing Jiangsu, 210009, Peop. Rep. China

SOURCE: Shiyou Huagong (2005), 34(12), 1168-1171

CODEN: SHHUE8; ISSN: 1000-8144

PUBLISHER: Shiyou Huagong Bianjibu

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

AB Non-catalytic transesterification of triacetin with methanol or ethanol under supercrit. state was investigated. The products were analyzed by high performance liquid chromatog. Yields of Me acetate and Et acetate were 100% and 60% resp., under adopted reaction conditions: mole ratio of alc. to triacetin 14, reaction temperature 350° and time 20 min. Kinetics of non-catalytic transesterification of triacetin was studied in supercrit. methanol or ethanol. The reaction was assumed to be a pseudo first order reaction under supercrit. state. It seemed that reaction rate

and product yield in methanol were faster and higher than those in ethanol. Apparent activation energies of reactions were 58.7 kJ/mol and 75.1 kJ/mol in methanol and ethanol, resp., which indicated the above transesterification reaction was easier to be carried out in methanol than in ethanol.

L5 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:1133248 CAPLUS

DOCUMENT NUMBER: 144:54191

TITLE: Transesterification of triacetin with methanol on solid acid and base catalysts

AUTHOR(S): Lopez, Dora E.; Goodwin, James G.; Bruce, David A.; Lotero, Edgar

CORPORATE SOURCE: Department of Chemical and Biomolecular Engineering, Clemson University, Clemson, SC, 29634, USA

SOURCE: Applied Catalysis, A: General (2005), 295(2), 97-105
CODEN: ACAGE4; ISSN: 0926-860X

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Biodiesel is a particularly attractive renewable fuel as it can be used in existing engines, is environmentally friendly, and is readily synthesized from animal fats and vegetable oils. Heterogeneous catalysts offer exciting possibilities for improving the economics of biodiesel synthesis; however, few published studies have addressed the use of such catalysts to date. The purpose of this research was to study the kinetics and selectivities of different solid catalysts for the transesterification of triacetin (a model compound for larger triglycerides as found in vegetable oils and fats) with methanol. Reaction was carried out at 60° in a batch reactor with a variety of solid and liquid, acid and base catalysts. The homogeneous phase (i.e., liquid) catalysts (NaOH and H2SO4) were studied for comparison. Amberlyst-15, Nafion NR50, sulfated zirconia, and ETS-10 (Na, K) showed reasonable activities, suggesting that they could be suitable alternatives to liquid catalysts. While on a weight% basis (of reaction mixture) the homogeneous phase catalysts gave higher rates of reaction, on a rate-per-site basis the solid acids were similar to H2SO4. Sulfated zirconia and tungstated zirconia had comparable turnover frequencies as H2SO4. The deactivation characteristics of some of these catalysts were also studied.

REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:953247 CAPLUS

DOCUMENT NUMBER: 144:152184

TITLE: Transesterification of glycerol triacetate with methanol on acid and base catalysts

AUTHOR(S): Lopez, Dora E.; Goodwin, James, Jr.; Lotero, Edgar; Bruce, David

CORPORATE SOURCE: Department of Chemical Engineering, Clemson University, Clemson, SC, 29634, USA

SOURCE: AIChE Annual Meeting, Conference Proceedings, Austin, TX, United States, Nov. 7-12, 2004 (2004), 028E/1-028E/6. American Institute of Chemical Engineers: New York, N. Y.

CODEN: 69GSKT; ISBN: 0-8169-0965-2
DOCUMENT TYPE: Conference; (computer optical disk)

LANGUAGE: English

AB The catalytic activities and selectivities of different types of catalyst materials for the transesterification reaction of triacetin were studied. Transesterification of triacetin was carried out using methanol to produce Me acetate and glycerol at 60 °C in the presence of a variety of solid and liquid catalysts. The solid acid catalysts used were, Amberlyst-15, supported phosphoric acid, sulfated zirconia, tungstated zirconia, zeolite H β and, ETS-10(H). The solid base catalysts used were MgO, and ETS-10 (Na). These results were compared to reactions using H₂SO₄ and NaOH. In general, base catalysts exhibited higher reactivities than acid catalysts. External and internal mass transfer limitations are of major importance for the transesterification reaction. Microporosity could severely limit catalyst materials, such as zeolites, when dealing with large species. Reactions expts. indicated that homogeneous catalysts were apparently more active than their resp. heterogeneous counterparts. However, Amberlyst-15, sulfated zirconia and ETS-10 (Na) showed reasonable good activities at this moderate temperature, indicating that they could be good alternatives to the homogeneous catalysts without the drawbacks of corrosion, difficulty in handling, and cost.

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:558567 CAPLUS

DOCUMENT NUMBER: 141:313005

TITLE: Comparative study on lipase-catalyzed transformation of soybean oil for biodiesel production with different acyl acceptors

AUTHOR(S): Du, Wei; Xu, Yuanyuan; Liu, Dehua; Zeng, Jing

CORPORATE SOURCE: Department of Chemical Engineering, Tsinghua University, Beijing, 100084, Peop. Rep. China

SOURCE: Journal of Molecular Catalysis B: Enzymatic (2004), 30(3-4), 125-129

CODEN: JMCEF8; ISSN: 1381-1177

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Me acetate, a novel acyl acceptor for biodiesel production has been developed, and a comparative study on Novozym 435-catalyzed transesterification of soybean oil for biodiesel production with different acyl acceptors was conducted and reported in this paper. Methanol has a serious neg. effect on enzymic activity. A molar ratio of methanol to oil of above 1:1 leads to serious inactivation of the enzyme. However, when Me acetate was used as the acyl acceptor, a yield of 92% of Me ester could be obtained with a molar ratio of Me acetate to oil of 12:1, and Me acetate showed no neg. effect on enzymic activity. Addnl., with crude soybean oil as the oil source and methanol as acyl acceptor, a much lower Me ester yield was obtained than that with refined soybean oil, while with Me acetate as acyl acceptor, an equally high yield of Me ester (92%) was achieved for both soybean oils. Lipase loses its activity very rapidly during repeated expts. with methanol as the acyl acceptor, while there is almost no detected loss in lipase activity, even after being continuously used for 100 batches, when Me acetate was used for biodiesel production. Moreover, the

byproduct triacetin is an important chemical with a higher value than glycerol, and this novel acyl acceptor seems very promising for lipase-catalyzed large-scale production of biodiesel.

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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(FILE 'HOME' ENTERED AT 08:18:26 ON 19 SEP 2008)

FILE 'CAPLUS' ENTERED AT 08:19:28 ON 19 SEP 2008

L1 0 S LOWER (2W) ALKYL (2W) TRIGLYCERIDE (2W) ESTER
L2 1984 S TRIBUTYRIN
L3 95 S L2 AND TRANSESTERIFICATION
L4 29 S L3 AND BUTYRATE
L5 7 S TRIACETIN (L) TRANSESTERIFICATION (L) (METHYL (2W) ACETATE)

=> s tripropionatin

L6 0 TRIPROPIONATIN
0 TRIPROPIONATIN

=> s triformatin

L7 0 TRIFORMATIN
0 TRIFORMATIN

=> s triformitin

L8 0 TRIFORMITIN
0 TRIFORMITIN

=> d his

(FILE 'HOME' ENTERED AT 08:18:26 ON 19 SEP 2008)

FILE 'CAPLUS' ENTERED AT 08:19:28 ON 19 SEP 2008

L1 0 S LOWER (2W) ALKYL (2W) TRIGLYCERIDE (2W) ESTER
L2 1984 S TRIBUTYRIN
L3 95 S L2 AND TRANSESTERIFICATION
L4 29 S L3 AND BUTYRATE
L5 7 S TRIACETIN (L) TRANSESTERIFICATION (L) (METHYL (2W) ACETATE)
L6 0 S TRIPROPIONATIN
L7 0 S TRIFORMATIN
L8 0 S TRIFORMITIN

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ALL L# QUERIES AND ANSWER SETS ARE DELETED AT LOGOFF
LOGOFF? (Y)/N/HOLD:y

STN INTERNATIONAL LOGOFF AT 08:40:11 ON 19 SEP 2008